

---

# Reading the sand: identifying bird tracks in Madagascar's spiny forest

*Joe Tobias and Nat Seddon*

---

La forêt épineuse du sud-ouest malgache est située sur un sol sablonneux sur lequel les espèces terrestres laissent des traces identifiables. Les sept espèces terrestres principales de cette forêt, comprenant les deux endémiques (le Brachyptérolle à longue queue *Uratelornis chimaera* et le Mésite monias *Monias benschi*), peuvent être recensées (et localisées) facilement en suivant ces traces. L'article donne des précisions sur l'identification de ces traces.

## Introduction

The dry forest of south-west Madagascar is a strange land of stunted baobabs *Adansonia*, spinescent cactus-like plants *Didierea* and *Alluaudia* and succulent flora (*Aloe* and *Euphorbia*). This area, commonly known as the spiny forest, is a conservation priority due to high rates of endemism and rapid forest loss<sup>1</sup>. To ornithologists, the area between the Fiherenana and Mangoky rivers is perhaps the most interesting, as it is home to two of Madagascar's most distinctive and specialised birds: Long-tailed Ground-Roller *Uratelornis chimaera* and Subdesert Mesite *Monias benschi*, both members of monotypic genera within endemic families.

One important feature of the spiny forest is that it stands on a substrate of sand. Every terrestrial forest creature thus leaves evidence of its movements in the form of footprints or body prints, from the clumsy clambering of chameleons, to the slithers of snakes and limbless skinks and tiptoeing of tenrecs. It is, unsurprisingly, much easier to find the tracks of terrestrial birds than the species themselves, and tracks provide information which can lead to sightings of their maker. Most pertinently, it is possible to determine roughly how recently tracks were made (within an hour they begin to lose their definition), and in which direction the bird went. Following fresh, correctly identified tracks regularly leads to sightings of mesites or ground-rollers, or the discovery of a nest, as well as many scratches from thorn-bushes.

Birders visiting the area near the villages of Ifaty and Mangily have for many years been taken to see the two sought-after endemics by local guides. After working with them, and three seasons of field work targeting the behavioural ecology of mesites and ground-rollers, we have become familiar with the tracks of a multitude of birds, reptiles and mammals. This knowledge proved immensely useful when searching for our study species, and vital during rapid surveys of remote regions when censusing their population and determining their distribution<sup>2</sup>. As this

information might therefore prove useful to field workers or visiting birders in the future, we offer brief details of track identification for the seven essentially terrestrial bird species in the spiny forest.

For the purposes of this article, the distance across the footprint at its broadest point is termed 'width', this being the distance between the tips of the inner and outer fore toes in all relevant species, except couas. In couas, measurements for the 'instep' (distance between tips of the two toes closest to the opposite foot) and 'outstep' (distance between the two toes furthest from the opposite foot) are given. It should be noted that footprints degrade with age and become harder to measure, and also that they appear larger and deeper in soft dry sand than in firm damp sand.

## Subdesert Mesite *Monias benschi*

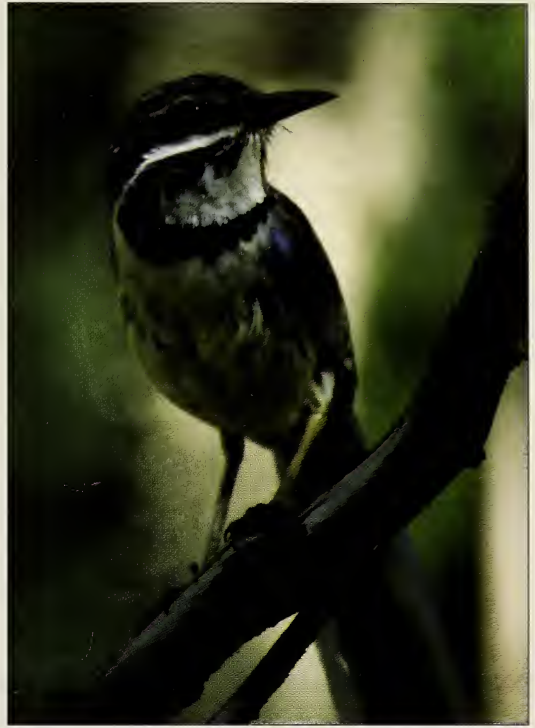
A group-living bird, thus one of the most distinctive features of mesite tracks is that they usually occur in sets of 2–8 in close proximity, often with subsets of 2–4 individuals following each other very closely. The footprint is a symmetrical trident shape, with all toes similar in length and the side toes forming c45° angles to the central toe. The gap between prints (usually 60–70 mm) is often distinctly larger than between the smaller hoopoe prints, or the very similar turtle-dove prints (see below), but note that stride length varies depending on circumstance. The length of the footprint is c55–65 mm and the width is c34–44 mm. The hind toe tends to drag sometimes, leaving an unusually elongated impression. Mesite prints are usually made in straighter lines than dove prints, the latter often proceeding in tight curves, often with the central fore toe pointing into the direction of the curve making the print asymmetrical (see below).

## Madagascar Buttonquail *Turnix nigricollis*

This species' feet, in common with all other members of its family, are tiny and lack a hind toe, making the identification of buttonquail tracks in the area straight-



Long-tailed Ground-Roller *Uratelornis chimaera*



Long-tailed Ground-Roller *Uratelornis chimaera*



Subdesert Mesite *Monias benschi*



Madagascar Buttonquail *Turnix nigricollis*



Running Coua *Coua cursor*



Green-capped Coua *Coua (ruficeps) olivaceiceps*

All photos by Joe Tobias



forward. The central toe is considerably longer (27–30 mm) than the outer toes (18–23 mm) and are arranged to form a neat shaft-less triplet, 27–30 mm across.

**Madagascar Turtle-Dove** *Streptopelia picturata*

This species leaves tracks remarkably similar to those of Subdesert Mesite (usually 55–68 mm long and 40–45 mm wide) and the two are easily confused.

Helpfully, dove tracks are normally encountered as lone individuals or pairs (though sometimes 3–4 loosely associated doves forage together, and lone mesites are not particularly rare); in shape they appear slightly stubbier than mesite tracks and are more often asymmetrical, the central fore toe being more mobile. A few further clues indicate that tracks are made by doves, not mesites. Firstly, they tend to be in fairly open areas, the doves often preferring to follow

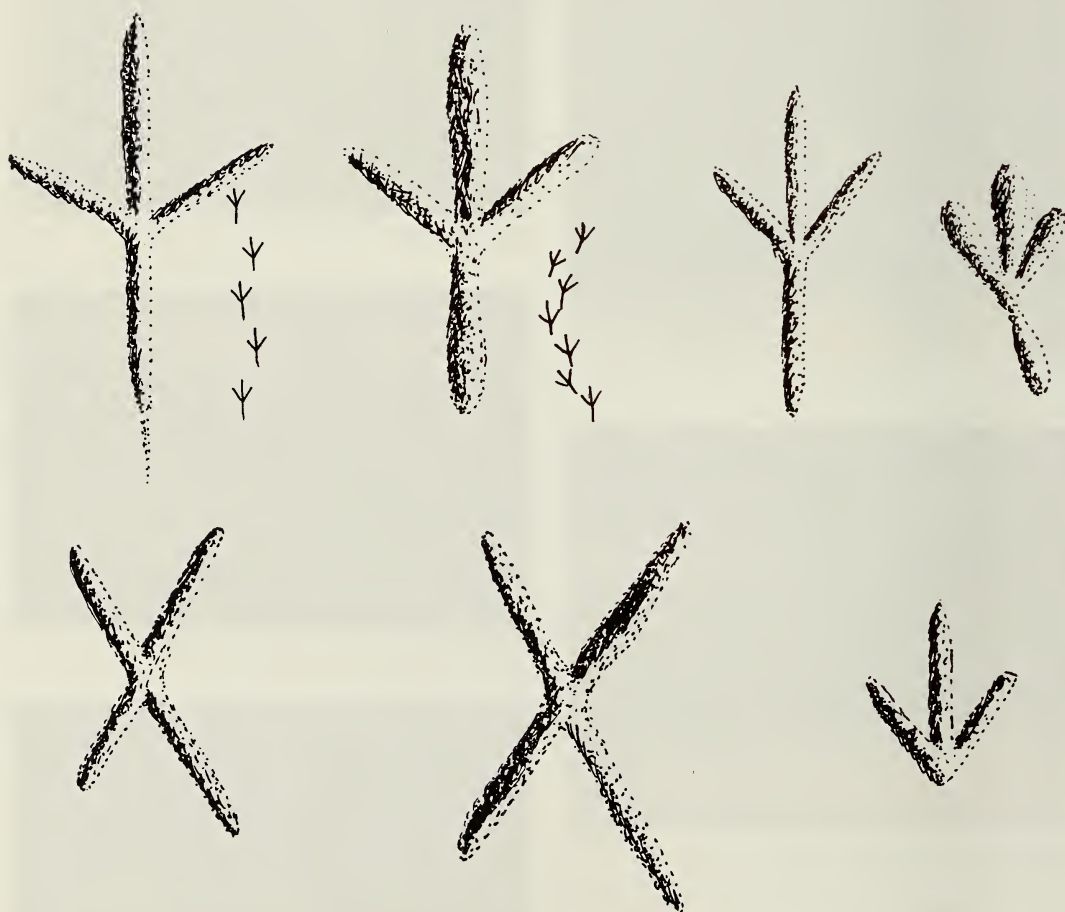


Figure 1. Diagrams of bird tracks in the spiny forest (82% life size); top row from left to right: Subdesert Mesite *Monias benschi*, Madagascar Turtle Dove *Streptopelia picturata*, Madagascar Hoopoe *Upupa marginata* and Long-tailed Ground-Roller *Uratelornis chimaera*; bottom row from left to right: Running Coua *Coua cursor*, Green-capped Coua *Coua (ruficeps) olivaceiceps* and Madagascar Buttonquail *Turnix nigricollis*. The two most similar are the mesite and dove, and these are most accurately separated by referring to their pattern of placement in the sand.

roads or paths rather than cross them; mesites tend to take the shortest routes between patches of cover. Secondly, doves regularly take to flight, the sudden termination of tracks being a useful pointer differentiating their tracks from those of mesites, which are very rarely interrupted by flight (unless you hire a guide to achieve this result). Thirdly, the gap between prints is shorter, usually 10–30 mm. Lastly, the direction of walking is much more irregular in doves than mesites, the former meandering in many tight curves, while the latter are more often in straight lines (see Fig 1). All of these criteria require some caution in their application as mesites can sometimes walk along roads or paths, forage or sing in apparently aimless convolutions and take flight when disturbed.

Only two other columbids occur in the spiny forest: Namaqua Dove *Oena capensis*, which has tiny feet, and should not be confused with any of the species treated here, and Madagascar Green-Pigeon *Treron australis*, which very rarely descends to the ground.

### **Running Coua *Coua cursor* and Green-capped Coua *Coua ruficeps* olivaceiceps**

Of the three species of coua in the spiny forest, Crested Coua *Coua cristata* is arboreal and rarely, if ever, leaves tracks. The two terrestrial couas, however, are both very common and possess similar foot structures. Both are immediately recognisable because of their zygodactylic feet that create small asymmetric crosses on the sand (see Fig 1). Couas have a shorter instep than outstep; that is the pair of toes closest to the opposite foot are shorter than the pair of toes furthest from the opposite foot. Care should be taken to check several prints as some can appear (through erosion or overlap with other prints) to have a single hind toe, or three forward-pointing toes, and are then potentially mistaken for mesite tracks. Once established as a coua, specific identity is based on size. The smaller of the duo is Running Coua, with an instep of 30–43 mm, an outstep of 42–48 mm and a width of 18–28 mm. Its larger cousin normally has an instep of 44–56 mm, an outstep of 58–78 mm and a width of 31–37 mm. There should thus be no confusion between tracks of the two.

### **Long-tailed Ground-Roller *Uratelornis chimaera***

This species leaves rather odd tracks, which can be identified with practise on the basis of several criteria. Its footprints are relatively small for its size (35–45 mm in length), but surprisingly far apart due to its long legs. The angle between the fore toes is variable, with some prints having these three toes fairly close together and others being more splayed (23–33 mm in width). For some reason, each fore toe often makes an unusual blob-shaped impression (see Fig 1). Another distinctive feature is the fairly short hind toe (13–17 mm) that is usually characteristically angled to the side.

Long-tailed Ground-Roller is encountered incredibly rarely in daylight; in c10 months of fieldwork at Mangily and PK32 we almost never met an individual that was not either singing or near a nest-burrow. Despite this its tracks and nests are quite easy to find and offer a much better means of determining its presence. That its tracks are often found in the centre of straight sandy roads where it is very rarely seen in daylight suggests that the species is more active nocturnally. This was proven during transects in the Mikea Forest after dark; several times we came across this fabulous ground-roller on forest roads.

### **Madagascar Hoopoe *Upupa marginata***

Prints left by the hoopoe are similar to mesite tracks, but considerably smaller and of slightly different structure. Their overall length is shorter (usually 48–57 mm), but more noticeably the outer toes are held at a more acute angle from the mid-line, making the foot overall less broad (usually 23–29 mm). The toes leave a slim impression and the long hind toe is in line with the central fore toe. 🦩

## **References**

1. Seddon, N., Tobias, J., Yount, J.W., Ramanampamonjy, J.R., Butchart, S. and Randrianzahana, H. 2000. Conservation issues and priorities in the Mikea Forest of south-west Madagascar. *Oryx* 34: 287–304.
2. Tobias, J. and Seddon, N. (submitted) A reassessment of population size in the Subdesert Mesite: implications for conservation. *Biol. Conserv.*

131 Catharine Street, Cambridge CB1 3AP, UK.